



# PROPOSED PLAN FOR FINAL REMEDIAL ACTION(S) AT LANDFILLS AND FIRE TRAINING AREAS IN GROUNDWATER ZONE 5 KING SALMON AIR STATION

**COMMENT PERIOD: March 29, 2004 to May 7, 2004**

611 CES/CEVR Installation Restoration Program, 10471 20<sup>th</sup> Street, Suite 302, Elmendorf Air Force Base, Alaska 99506-2200

## INTRODUCTION

This *Proposed Plan* describes environmental cleanup options and recommendations for eight (8) *Installation Restoration Program (IRP)* sites located at the *King Salmon Air Station (KSAS)*. The eight sites are listed below:

- Circle Landfill (LF006),
- Landfill No. 3 (LF007),
- Fire Training Area 1 (FT001),
- The Radar Approach Control Building (RAPCON) (FT001),
- Fire Training Area 2 (FT002),
- Fire Training Area 3 (FT003),
- Fire Training Area 4 (FT004), and
- Groundwater Zone 5 (OT031).

For convenience to the reader, terms in ***bold italic*** are defined in the Glossary included at the end of this *Proposed Plan*.

The *IRP* is the United States Air Force's (*USAF*) program modeled after the *Environmental Protection Agency's (EPA's)* environmental cleanup program. *USAF*, in conjunction with the Alaska Department of Environmental Conservation (*ADEC*), has issued this *Proposed Plan* to solicit review and comments from community participants on final cleanup options proposed for the eight *IRP* Sites.

Both *USAF* and *ADEC* encourage public participation in the decision-making process. A 30-day comment period is provided, and all comments should be sent to *USAF*. A mailing

## Regulatory Basis

This plan is issued in accordance with and satisfies the requirements of the Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA, at 42 USC §§ 9601 et. Seq.), as further implemented by the National Contingency Plan (NCP, at 40 CFR Part 300). The IRP is authorized in the Defense Environmental Restoration Program (10 USC §§ 2701 et. seq.) as the environmental restoration program the Services are to use to take CERCLA response actions and satisfy its CERCLA lead agency functions as delegated by Executive Order 12580. The plan also meets all requirements of Alaska State law and regulations, including but not limited to Title 46 of the Alaska Statutes and regulations promulgated thereunder.

and email address is provided below, and a pre-addressed comment form is included at the end of the plan.

Following consideration of public comments received on the plan, *USAF* will prepare a *Record of Decision (ROD)* to document the final selected remedy for the subject *IRP* sites. The *ROD* will contain a summary of responses to public comments (*Responsiveness Summary*)

## How You Can Participate

You are encouraged to comment on this Proposed Plan. The public comment period begins March 27 and ends on May 7, 2004. You can mail or email your comments to the *USAF* Community Relations Coordinator at the following address:

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This Proposed Plan is also available on the following websites:

<http://www.elmendorf.af.mil> and  
<http://www.state.ak.us/dec/spar/csp/sites/kingsalmon.htm>

### **SUMMARY OF EVALUATED AND PROPOSED CLEANUP ACTIONS**

The subject sites contain landfills and water, soil, and wetland sediment impacted by petroleum hydrocarbons commingled with *CERCLA hazardous substances*. The following remedial alternatives were **evaluated** in the *feasibility studies (FS)* to address the contaminated media:

#### **Landfills**

- No Action,
- Limited Soil Removal and Treatment, and
- Landfill Soil and Vegetative Cover.

#### **Soil**

- No Action,
- Excavation and Biocell Treatment of Soil,
- Excavation and Thermal Treatment of Soil,
- Natural Attenuation, and
- Bioventing.

#### **Groundwater**

- No Action,
- *Monitored Natural Attenuation (MNA)*, and
- Extraction and Treatment of Groundwater Using an Air Stripper and Activated Carbon.

#### **Wetlands**

- No Action and
- Managed Wetlands

The actions **proposed** to protect human health and the environment and to comply with state and federal *applicable or relevant and appropriate requirements (ARARs)* are summarized below for each site. These actions (including the proposed *Institutional Controls [ICs]*) are discussed in further detail on pages 8 through 26 of the *Proposed Plan*.

- LF006 (Circle Landfill): Limited source area soil removal and treatment (excavation/treatment) and installation of vegetated soil cover material as needed. Afterwards, *Institutional Controls (ICs)* with *no further*

*response action planned (NFRAP)* status will be noted in *USAF* and *ADEC* records.

- LF007 (Landfill No. 3): *Institutional Controls (ICs)* with *NFRAP* status.
- FT001 (Fire Training Area No. 1):
  - Natural attenuation of soil with future soil sampling to confirm that *cleanup levels* have been achieved;
  - Annual testing of groundwater to assess progress of *MNA*; and
  - *Institutional Controls (ICs)*.
- FT001 (RAPCON):
  - Continued operation of the *bioventing* system;
  - Natural attenuation of soil outside of the *bioventing* area, with future soil sampling to confirm that *cleanup levels* have been achieved;
  - Annual testing of groundwater and surface water to assess progress of *MNA*; and
  - *Institutional Controls (ICs)*.
- FT002 (Fire Training Area No. 2): Collect soil and groundwater samples.
  - If there is no contamination above *cleanup levels*, no action is required and *site closure* will be implemented.
  - If there is soil contamination above *cleanup levels*, it will be excavated and treated in a bioremediation treatment cell at KSAS.
  - If there is groundwater contamination, it will be remedied by *MNA*, and *ICs* will be implemented.
- FT003 (Fire Training Area No. 3): No action; *site closure*.
- FT004 (Fire Training Area No. 4): Collect soil and groundwater samples.
  - If there is no contamination above *cleanup levels*, no action will be required and *ICs* with *NFRAP* status will be noted in *USAF* and *ADEC* records for the site.

- If there is soil contamination above *cleanup levels*, it will be excavated and treated in a bioremediation treatment cell at *KSAS*.
- If there is groundwater contamination, it will be remedied by *MNA* and *ICs* will be implemented.
- OT031 (Groundwater Zone 5): Administrative closure. Groundwater contamination will be remedied with its associated soil *IRP* site (e.g., FT004 groundwater is addressed in the FT004 remedy).

As required by *CERCLA* § 121(c), for all sites with contamination remaining above levels allowing for unlimited use and unrestricted exposure, a review of the site remedies will be performed at a frequency of no less often than five years (*five-year review*). All monitoring results will be provided on an informational basis by *USAF* to *ADEC*, *EPA*, Naknek/South Naknek Native Village Councils, King Salmon Village Council, Federal and State trustees, and the King Salmon *Restoration Advisory Board (RAB)*.

## ORGANIZATION OF PROPOSED PLAN

The rest of this *Proposed Plan* discusses how the *USAF* and *ADEC* identified these proposed actions. General information relevant to all of the subject sites is followed by individual information summaries for each site.

## KSAS BACKGROUND

*KSAS*, formerly known as King Salmon Airport (KSA), is located in southwest Alaska, on the Alaska Peninsula, approximately 280 air miles southwest of Anchorage.

*KSAS* consists of about 800 acres on approximately 20 separate land parcels. The main installation was constructed in 1940 as part of an airfield construction program. Since then, the facility has provided staging, refueling, operational, and maintenance support for military aircraft. During the time when the *KSAS* facilities were in active use by *USAF*,

hazardous and potentially *hazardous substances* were used or stored there to support base activities. The *KSAS* alert mission was terminated in 1994, and the base was placed in caretaker status, with day-to-day facility maintenance and operations provided by a contractor.

The landfill and fire training area sites



addressed in this Plan are located approximately one to two miles east-southeast of the main base area near the airport runways.

## LAND USE

The subject area contains no residential structures and is undeveloped with the exception of a Federal Aviation Administration (FAA) radar station. There is unrestricted access for community members who use the land for recreational purposes (shooting, hunting, walking, etc.) *USAF* plans to keep the area undeveloped. Shallow groundwater is not used as a drinking water source; a detailed discussion of groundwater use is provided on page 32 at the end of this Proposed Plan.

## OVERALL CLEANUP OBJECTIVES

The overall cleanup objectives are to restore each site to a level that is protective of human health and the environment and to comply with *Applicable or Relevant and Appropriate Requirements (ARARs)*. ARARs represent the universe of state and federal regulations that are potentially applicable to site concerns. Specific cleanup objectives for each site are discussed on pages 8 through 26 of this Proposed Plan; the governing cleanup levels for soil, water, surface water, and sediments are discussed below.

### SOIL AND GROUNDWATER

ADEC 18 AAC 75 (Oil and Hazardous Substances Pollution Control Regulations) *Method 2 cleanup levels* are considered protective of human health and the environment at the subject sites<sup>1</sup>. *Method 2 cleanup levels* (as tabulated in 18 AAC 75 Tables B and C) are considered protective for unrestricted land use and unrestricted access.

However, if groundwater at a site is not considered drinking water, 18 AAC 75.350 provides that *cleanup levels* may be adjusted upward by a factor of ten, with *ICs* required to restrict groundwater use. The adjustment is informally known as the *ten times rule*. 18 AAC 75.350 specifies the criteria that must be met for the *ten times rule* to be valid. The criteria, which are provided on pages 32-34 of this Proposed Plan, consider the suitability of the *aquifer* for a drinking water source, historical and potential future use of the *aquifer* for a drinking water source, and the availability of

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<sup>1</sup> Tabulated *cleanup levels* provided in 18 AAC 75 are considered protective of human health; ecological protectiveness is evaluated on a site-by-site basis. A plant and fish tissue study performed for FT001 and LF007 (*Human Food Chain, Aquatic Biota, and Wetlands Evaluations, King Salmon Airport, Alaska, Final Technical Report*. (USAF [OASIS], November 1998) showed no evidence that contamination levels have adversely affected the environment.

alternative drinking water sources. When the *ten times rule* is implemented at a site, *ICs* are required to restrict groundwater use as a drinking water source.

USAF is proposing that groundwater at sites LF006, FT001, RAPCON, and FT004 meets the criteria for a non-drinking water designation, as defined in 18 AAC 75.350. A detailed discussion of the proposed non-drinking water designation is attached at the end of the *Proposed Plan* (page 32).

Specific *cleanup levels* for chemicals detected at each of the subject sites are summarized in Tables 2 through 6 on pages 8 through 26.

### SURFACE WATER AND SEDIMENTS

Surface water criteria provided in ADEC 18 AAC 70 (Alaska Water Quality Standards) are appropriate for surface water at the subject sites. These levels are protective of human health and the environment.

Although there are no sediment *cleanup levels* established in regulation, Alaska water quality regulations (18 AAC 70) state that sediment contamination may not cause adverse effects on aquatic life. Similarly, the *EPA* has published a Contaminated Sediment Management Strategy that establishes goals for assessing and ultimately reducing sediment contamination nationwide. The *EPA* is in the process of developing sediment quality criteria that are not intended for use as mandatory *cleanup levels*, but rather as a means to identify potential contamination problems.

Although the state of Alaska and the *EPA* have not published sediment quality criteria, *sediment benchmark screening levels (SSLs)* published by several research organizations (e.g., Oak Ridge National Laboratories [ORNL] and the National Oceanic and Atmospheric Administration [NOAA]) are appropriate for use in evaluating contaminants detected in river or creek sediments.

If contaminant levels in sediment samples do not exceed *SSLs*, then no further action is necessary. If contaminant levels in sediment

samples exceed SSLs, then further evaluation is warranted. At KSAS, further evaluation (an ecological risk assessment and a plant and tissue study) was performed, as discussed in the next section.

## SUMMARY OF SITE CONDITIONS

Extensive environmental assessment work has been performed at the subject sites since 1992. Key reports documenting conditions at the subject sites are listed below:

- *King Salmon Airport Remedial Investigation Final Report* (USAF [EMCON], 1995a)
- *King Salmon Airport Limited Field Investigation* (USAF [EMCON], 1995b)
- *Record of Decision for Five Installation Restoration Program Sites at King Salmon Air Force Base, King Salmon, Alaska* (USAF, 1995)
- *Final Source Investigation and Removal Action, Fire Training Area No. 1* (USAF [EMCON], April 1996)
- *Draft Intrinsic Remediation Treatability Study for Site FT01, King Salmon Airport* (USAF [Parsons], May 1996).
- *Treatability Study Report for FT01 and Vicinity* (USAF [Radian], April 1997)
- *Treatability Study Report for FT04 and Vicinity* (USAF [Radian], May 1997)
- *Final Eskimo Creek Dump and Landfill No. 3 Remedial Investigation Report* (USAF [EMCON], July 1997).
- *Fire Training Areas No. 1, 2, 3, and 4 Summary of Findings and Recommendations, May 1997 Groundwater Sampling Event* (Radian, 3 September 1997 letter report)
- *Fire Training Areas No. 1, 2, 3, and 4 RAPCON Excavation Activities and Summary of Findings* (Radian, 15 October 1997 letter report)

- *Human Food Chain, Aquatic Biota, and Wetlands Evaluations, King Salmon Airport, Alaska, Final Technical Report.* (USAF [OASIS], November 1998)
- *Final Underground Storage Tank and Pipeline Monitoring Report, King Salmon Airport, Alaska.* (USAF [Bristol], April 2001)
- *2000 Limited Field Investigation at Landfill No. 3 (Site LF07)* (USAF [URS], April 18, 2001)
- *Circle Landfill Remedial Investigation, Draft* (USAF [URS], June 2001)
- *King Salmon Remedial Process Optimization Report* (USAF [EarthTech], June 2002)

All of the documents listed above are contained in the **Administrative Record** for KSAS. Access information for the **Administrative Record** is provided on page 27 of this **Proposed Plan**.

## SUMMARY OF SITE RISKS

Risk to human health and the environment resulting from contamination at KSAS sites, including the subject sites, was evaluated in the following reports.

- *Final Human Health Risk Assessment for King Salmon Airport* (USAF (EMCON), June 1995)
- *Final Ecological Risk Assessment for King Salmon Airport* (USAF (EMCON), August 1995)
- *Human Food Chain, Aquatic Biota, and Wetlands Evaluations, King Salmon Airport, Alaska, Final Technical Report.* (USAF [OASIS], November 1998)

The *Ecological Risk Assessment for King Salmon Airport* included Red Fox Creek adjacent to Fire Training Area No. 1 (FT001) and RAPCON. The ecological risk assessment concluded that small-bodied, ground-feeding birds and mammals were potentially at risk from ingestion of food and soil contaminated with dioxins and petroleum hydrocarbons (most of the potential risk came from **DRO**). Most of the soil

contamination was removed in the 1995 Fire Training Area No. 1 and 1997 RAPCON soil excavations (discussed further on pages 13 and 16; therefore, most of the associated potential ecological risk was also alleviated. A further ecological evaluation was performed in 1996 and 1997. The *Human Food Chain, Aquatic Biota, and Wetlands Evaluations* investigated effects of site contamination on water bodies base-wide (Red Fox Creek, King Salmon Creek, Eskimo Creek, No Name Creek) and associated wetlands, fish, and plants. This follow up work to the human health and ecological risk assessments was performed in response to community concerns about cancer risks in subsistence foods. At Red Fox Creek and No Name Creek, there was no evidence of stressed vegetation, and fish were present. **DRO** and **GRO** were detected at concentrations that are suspected to occur naturally in the plant and fish tissues analyzed. **TCE**, **BTEX**, and **PAHs** were not detected in fish tissue or mushroom samples, and only toluene was detected in two of seven berry samples. Overall, the study concluded that uptake of contaminants into ecological receptors has not occurred.

The preferred cleanup options presented in this **Proposed Plan** will restrict people from being exposed to unacceptable levels of contamination present at the subject fire training areas and landfills. **Institutional controls** will restrict excavations or other means for direct exposure to subsurface contamination during, and potentially after, the cleanup phase.

## CLEANUP ALTERNATIVES

Remedial alternatives were evaluated for the **KSAS** Fire Training and Landfill **IRP** sites in the following *feasibility study (FS)* reports:

- *King Salmon Airport, King Salmon, Alaska Final Feasibility Study Report (Revised)* (EMCON, 1997);
- *Treatability Study Report for FT01 and Vicinity* (USAF [Radian], April 1997);
- *Treatability Study Report for FT04 and Vicinity* (USAF [Radian], May 1997);
- *UST and Pipeline Monitoring Report* (Bristol/OASIS, April 2001); and
- *Circle Landfill Remedial Investigation, Draft* (USAF [URS], June 2001).

In the above reports, the cleanup alternatives were evaluated with respect to seven of the nine **NCP** criteria shown in Table 1 (the Threshold and Balancing Criteria). The Modifying Criteria will be addressed in the **ROD**. A comparative analysis was performed to identify the advantages and disadvantages of each cleanup alternative relative to the other alternatives. The cleanup alternatives evaluated for each site are presented in the sections of this **Proposed Plan** that follow this discussion.

## RECOMMENDED ACTIONS

The recommended cleanup actions were established by *USAF* after careful consideration of the available information and input from *ADEC*. Recommended cleanup actions for each subject site are presented in the sections that follow.

**Table 1: NCP Evaluation Criteria**

Threshold Criteria

**Overall Protection of Human Health and the Environment** – Does the remedial alternative provide adequate protection of human health and the environment?

**Compliance with ARARs** – Does the remedial alternative meet all of the federal and state regulations? Does it justify a waiver from a regulation?

Balancing Criteria

**Long-Term Effectiveness and Permanence** – What level of long-term effectiveness and permanence is expected from the remedial alternative? How certain is it that the alternative will prove successful?

**Reduction of Toxicity, Mobility, and Volume**– What is the anticipated performance of the remedial technology, based on the reduction of toxicity, mobility, and/or volume, through treatment?

**Short-Term Effectiveness** – Are there any short-term risks to the community during the construction and implementation phase of the remedial alternative? How effective is the remedial technology in the short-term?

**Implementability** – What is the technical and administrative feasibility of the remedial alternative, based on the availability of materials and services needed for implementation?

**Cost** – How cost-effective is the remedial alternative based on design, construction, start-up, monitoring, and maintenance costs? Cost estimate is accurate to within –30 percent to + 50 percent.

Modifying Criteria

**State Acceptance** – This criterion addresses state concerns.

**Community Acceptance** – This criterion addressed concerns of the community.



## CIRCLE LANDFILL (LF006)

### Site Description

LF006 (Circle Landfill) is located approximately one mile southeast of KSAS. The landfill was reportedly used from the early 1950s through the 1960s. Aerial photographs of Circle Landfill show areas of solid waste dumping and drum disposal. Trenches and areas of standing liquid are also shown in some of the photographs.

### Cleanup Actions To-Date

No cleanup actions have been performed to-date.

### Summary of Site Conditions

During the 2000 *Remedial Investigation (RI)*, petroleum hydrocarbons (primarily *DRO*), chlorinated solvents (*PCE* and *TCE*), and pentachlorophenol were detected in soil at concentrations above *cleanup levels*. *Polychlorinated biphenyls (PCBs)* were detected in two soil samples at concentrations above

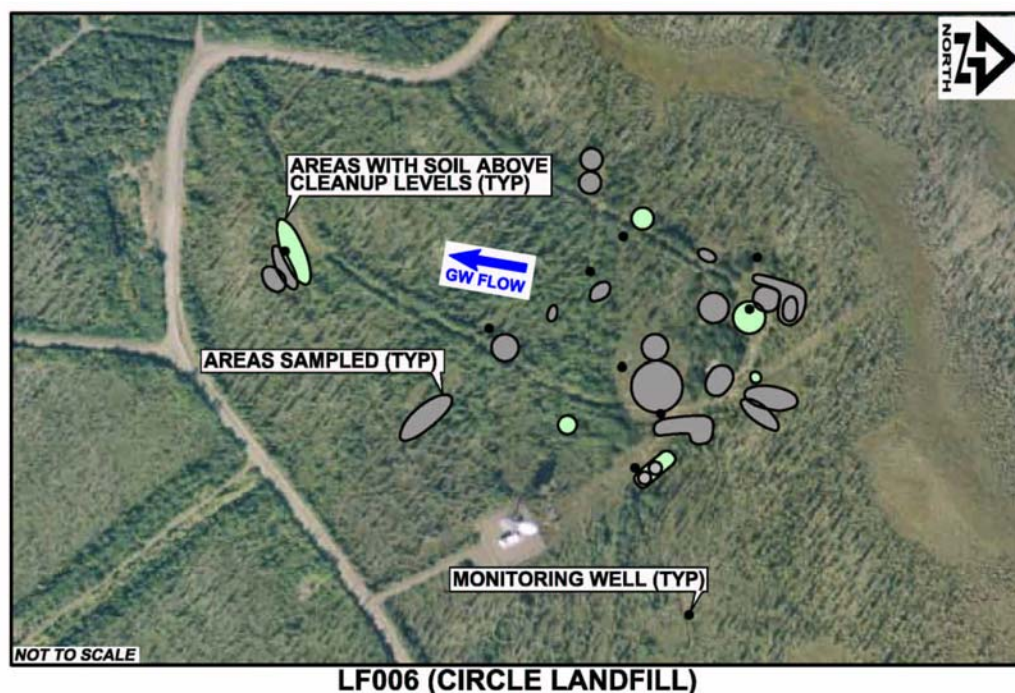
residential *cleanup levels* and ecological screening levels.

The contaminated soil was found in several discrete locations within Circle Landfill (see figure below). The total estimated volume of soil contaminated with petroleum hydrocarbons above *cleanup levels* is approximately 2,000 cubic yards, and the total estimated volume of soil contaminated with *PCBs* is 30 cubic yards.

Several analytes were detected in Red Fox Creek sediments at concentrations above *SSLs*; however, the 1996-1997 *Human Food Chain, Aquatic Biota, and Wetlands Evaluation* indicated that chemical levels in Red Fox Creek plant tissue and fish tissue were below *EPA* and *ADEC* target risk levels for human ingestion, and that uptake of contamination into ecological receptors has not occurred.

### Circle Landfill Cleanup Objectives

Landfills with undocumented contents (e.g., Circle Landfill) require *institutional controls (ICs)* to restrict access to potentially hazardous





**Proposed Plan for Final Remedial Action(s) at Landfills and Fire Training Areas in Groundwater Zone 5 -  
King Salmon Air Station**

substances in the landfill.

The cleanup objectives for Circle Landfill are listed below:

- Clean up contaminated soil to the applicable *cleanup levels* (summarized in Table 2);
- Restrict access to potentially hazardous substances in the landfill; and
- Restrict the use of the unconfined aquifer as a drinking water source as long as the ten times rule is in effect.

**Table 2: Circle Landfill Cleanup Levels**

Contaminant of Concern	Maximum Concentration	Maximum Concentration Location (Date)	Proposed RAO	Basis
<b>Groundwater (mg/L)</b>				
DRO	2.0	MW-01 (2000)	15	18AAC 75 <sup>a</sup>
TCE	0.012	MW-05 (2000)	0.05	18AAC 75 <sup>a</sup>
Arsenic	0.154	RFCWP10 (2000)	0.5	18AAC 75 <sup>a</sup>
Lead	0.0157	RFCWP10 (2000)	0.15	18AAC 75 <sup>a</sup>
<b>Soil (mg/kg)</b>				
DRO	<b>53,900</b>	(1996) <sup>b</sup>	2,500	18AAC 75 <sup>a</sup>
RRO	<b>127,000</b>	(1996) <sup>b</sup>	10,000	18AAC 75
TCE	<b>0.012</b>	E39 (0-1' bgs) (2000)	0.27	18AAC 75 <sup>a</sup>
PCE	<b>0.1F</b>	E39 (0-1' bgs) (2000)	0.03	18AAC 75
Pentachlorophenol	<b>0.35F</b>	MW-08 (0-2' bgs) (2000)	0.01	18AAC 75
PCBs	<b>4.2</b>	Q04 (0-2' bgs) (2000)	1 <sup>c</sup>	18AAC 75

**Definitions and Notes:**

18AAC75 =

Oil and Hazardous Substances Pollution Control Regulations (ADEC, 2003)

RAO = remedial action objectives bgs = below ground surface

DRO = diesel-range organics RRO = residual-range organics

TCE = trichloroethene

PCE = tetrachloroethene PCB = polychlorinated biphenyl

mg/kg = milligrams per kilogram mg/L = milligrams per liter

F = Estimated value (analyte was positively identified but concentration is below quantitation limit)

<sup>a</sup> 18 AAC 75 with application of the ten times rule.

<sup>b</sup> Samples collected by USAF personnel in 1996.

<sup>c</sup> Residential soil cleanup level is 1 mg/kg.

Detections above cleanup levels are shown in **bold font**.

The *cleanup levels* for Circle Landfill are provided in Table 2. Note that none of the detected contaminants were above groundwater *cleanup levels* (using the *ten times rule*).

**Remedial Alternatives Evaluated**

The following remedial alternatives were evaluated for addressing contaminated media at Circle Landfill.

- No action,
- Excavation and biocell treatment of petroleum-contaminated soil,
- Excavation and off-site treatment in an EPA-approved treatment facility of *PCB*-contaminated soil, and
- Surface debris removal and vegetative cover, as needed.

**Proposed Remedy**

Contamination detected at Circle Landfill, if left untreated, is considered to pose an unacceptable risk to human health and the environment. The final remedy proposed for this site includes the following components:

**Soil**

- Excavation of approximately 2,000 cubic yards of source area soil contaminated with *DRO* and *RRO* above *cleanup levels* and treatment in a bioremediation treatment cell at KSAS to *cleanup levels* appropriate for the final disposition area within KSAS.
- Excavation of approximately 30 cubic yards of source area soil contaminated with *PCBs* and transport to an *EPA*-approved *CERCLA* treatment facility, in compliance with *CERCLA* section 121(d)(3), as further implemented at 40 CFR 300.440.
- Collecting the minimum number of soil samples necessary to characterize the area where pentachlorophenol was detected (in only one sample),
  - If pentachlorophenol is not detected above its *cleanup level*, then no action is necessary.
  - If pentachlorophenol is detected above its *cleanup level*, the contaminated soil

will be excavated and transported to an EPA-approved CERCLA treatment facility in compliance with CERCLA section 121(d)(3), as further implemented at 40 CFR 300.440.

considered to best meet the site cleanup objectives and NCP evaluation criteria. The no action alternative is not protective of human health or the environment.

- Removing surface debris, filling in surface depressions, and revegetating the surface as necessary to facilitate surface water drainage and minimize ponding, and
- Implementing the following *Institutional controls (ICs)* to restrict excavations and other subsurface activities at the landfill during and after remediation:
  - ICs will be documented in the King Salmon Base General Plan, and appropriate notice only will be filed in appropriate state land records.
  - USAF's dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
  - Periodic visual inspections will be performed to verify effectiveness of the ICs.

#### Groundwater

- ICs will be documented in the King Salmon Base General Plan and appropriate notice only will be filed in appropriate state land records to restrict the drilling of drinking water wells as long as the *ten times rule* is in effect.
- USAF's dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
- Periodic visual inspections will be performed to verify effectiveness of the ICs.

After soil sampling, excavation, and treatment activities have been completed, ICs with *NFRAP* status will be noted in USAF and ADEC records for Circle Landfill.

The estimated present worth cost associated with the proposed final remedy is \$450,000 to \$975,000.

The proposed remedy outlined above is

## LANDFILL NO. 3 (LF007)

### Site Description

Landfill No. 3 (LF007) is located approximately 4,000 feet northeast of Runway 29 and along the access road to the Naknek Recreational Camps. The landfill was constructed in an intermittent stream valley and was reportedly used from 1969 to 1976. The banks were bulldozed into the disposal area for cover material. The wastes reportedly sent to this landfill were refuse, scrap metal and equipment, and some small quantities of shop wastes such as paints and thinners.

### Cleanup Actions To-Date

During the 1980s, the landfill was covered by approximately 2 feet of clean fill material.

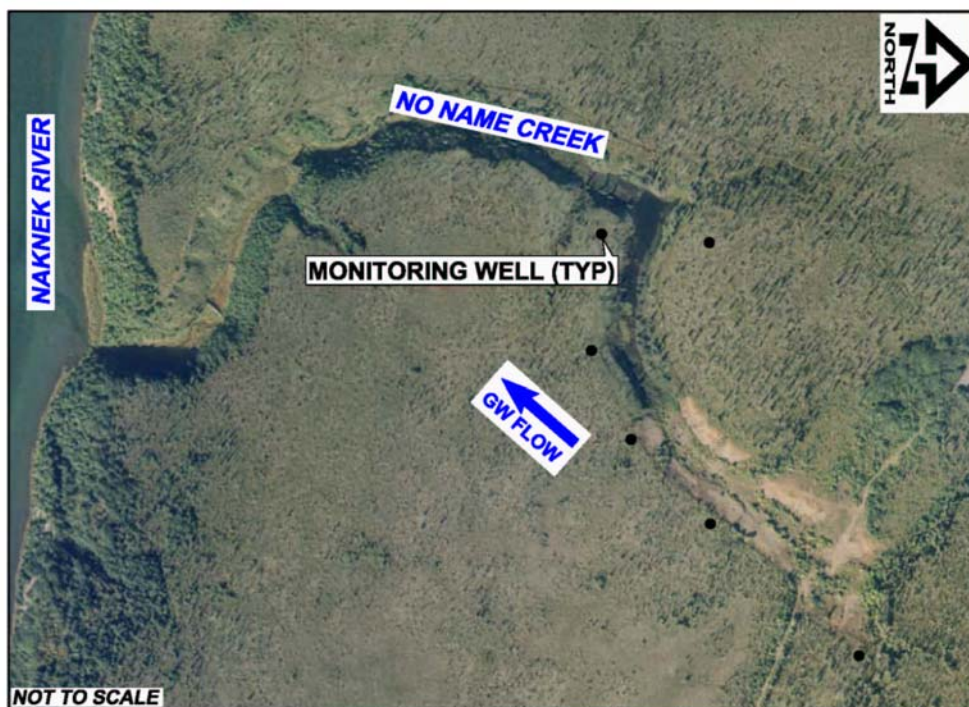
### Summary of Site Conditions

Based on the most recent soil sampling (1993 and 1996), contamination levels remaining in LF007 soil and groundwater do not pose an unacceptable risk to human health or the environment.

Several analytes were detected in No Name Creek sediments at concentrations above *SSLs*; however, the 1996-1997 *Human Food Chain, Aquatic Biota, and Wetlands Evaluation* indicated that chemical levels in No Name Creek plant tissue and fish tissue were below *EPA* and *ADEC* target risk levels for human ingestion, and that uptake of contamination into ecological receptors has not occurred.

### Landfill No. 3 Cleanup Objectives

Landfills with undocumented contents (e.g., Landfill No. 3) require *institutional controls*



LF007 (LANDFILL No. 3)

(ICs) to restrict access to potentially hazardous substances in the landfill.

There were no contaminants detected above regulatory levels in LF007 soil and groundwater; therefore, no cleanup is necessary.

#### **Proposed Remedy**

The following *institutional controls (ICs)* will be used to restrict excavations and other subsurface activities at the landfill.

- *ICs* will be documented in the King Salmon Base General Plan, and appropriate notice only will be filed in appropriate state land records.
- *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
- Periodic visual inspections will be performed to verify effectiveness of the *ICs*.

There is no further action required to protect human health or the environment at LF007, except *ICs*. Therefore, *ICs* with *NFRAP* status will be noted in USAF and ADEC records for this site.

## FIRE TRAINING AREA NO. 1 (FT001)

### Site Description

Fire Training Area No. 1 (FT001) is located approximately 2,000 feet north of Runway 29 and 1,500 feet east of Runway 36. The fire training area is a circular depression measuring approximately 50 feet in diameter. It was used monthly from 1980 until approximately 1992 for fire training exercises using petroleum hydrocarbons, solvents, and fire retardant chemicals. In addition, an above ground storage tank for fire training purposes was formerly located at this site.

### Cleanup Actions To-Date

In 1995, approximately 2,000 cubic yards of

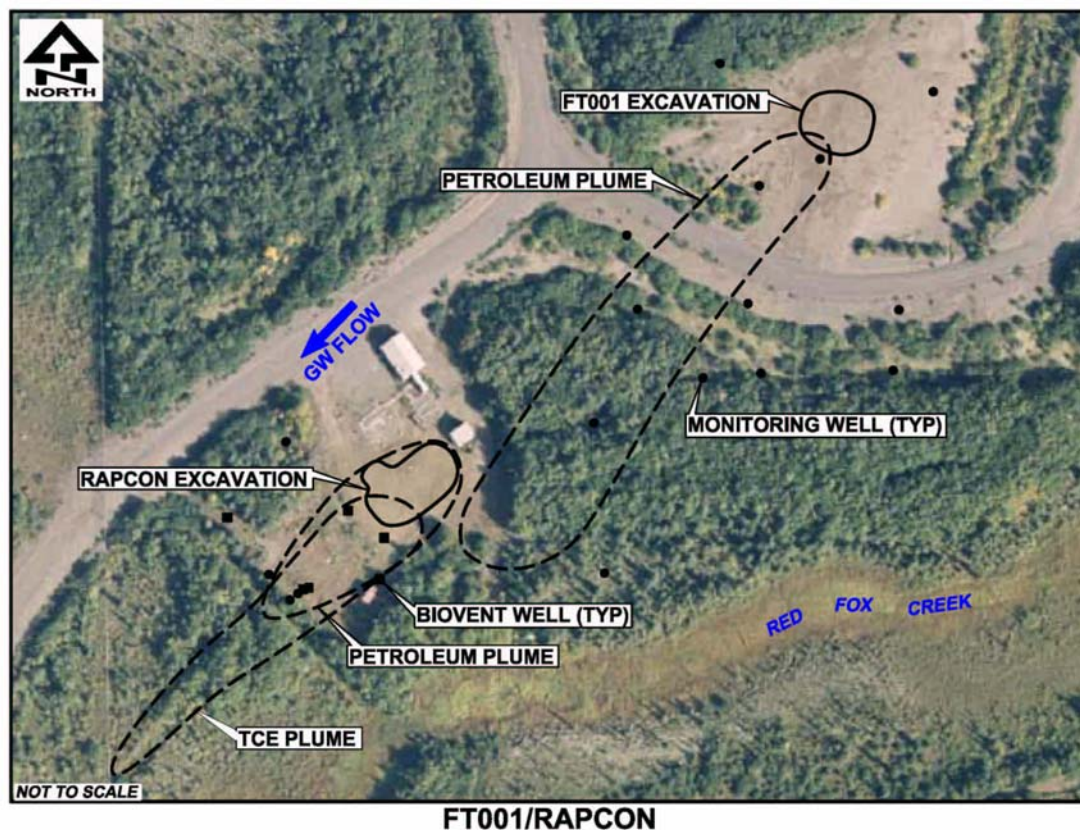
petroleum-impacted soils were removed from Fire Training Area No. 1. Contaminated soil was excavated down to groundwater; *free product* on the exposed groundwater was skimmed using sorbent boom materials. Excavated soils were treated in bioremediation treatment cells at KSAS.

### Summary of Site Conditions

Based on the 1993-94 *RI* and follow up sampling conducted between 1994 and 1997, petroleum hydrocarbon (*DRO*, *GRO*, and *benzene*, *toluene*, *ethylbenzene*, and *xylene*s [*BTEX*]) contamination of soil and groundwater is associated with Fire Training Area No. 1. In addition, *tetrachloroethene* (*PCE*) was detected above its cleanup level in one soil sample.

### Soil Contamination:

The soil excavations at Fire Training Area No. 1



removed the area of highest contamination. Most of the remaining soil contamination is located near the *water table* (approximately 12 to 15 feet *below ground surface* [bgs]) and is related to the groundwater contamination, e.g., the soil contamination indicates a *smear zone* where free phase product migrated with groundwater and became trapped in the subsurface soil near the *water table*.

*Petroleum Hydrocarbon Plume:*

The FT001/RAPCON figure depicts the Fire Training Area No. 1 petroleum hydrocarbon plume based on the most recent sampling event (1997), along with the RAPCON plumes discussed in the following section of this Proposed Plan.

**Fire Training Area No. 1 Cleanup Objectives**

The cleanup objectives for Fire Training Area No. 1 are listed below:

- Natural attenuation of contaminated soil and groundwater to the applicable cleanup levels (summarized in Table 3);
- Restrict access to contaminated soil and groundwater until it is cleaned up; and
- Restrict the use of the unconfined aquifer as a drinking water source during and after remediation as long as the *ten times rule* is in effect.

The cleanup levels for Fire Training Area No. 1 are provided in Table 3. As shown in Table 3, the *cleanup levels* for contaminants detected in groundwater have been modified by the *ten times rule*.

**Table 3: Fire Training Area No. 1 Cleanup Levels**

Contaminant of Concern	Maximum Concentration	Maximum Concentration Location (Date)	Proposed RAO	Basis
<b>Groundwater (mg/L)</b>				
DRO	<b>71</b>	MW-95 (1993)	15	18AAC 75 <sup>a</sup>
GRO	<b>35.2</b>	ESMW-1A (1996)	13	18AAC 75 <sup>a</sup>
Benzene	<b>1.05</b>	ESMW-1A (1994)	0.05	18AAC 75 <sup>a</sup>
Toluene	6.47	ESMW-1A (1994)	10	18AAC 75 <sup>a</sup>
EDB	<b>0.0902</b>	ESMW-5A (1996)	0.0005	18AAC 75 <sup>c</sup>
<b>Soil (mg/kg)</b>				
DRO	<b>8,810</b>	651 (5' bgs) (1994)	2,500	18AAC 75 <sup>a</sup>
GRO	<b>46,000</b>	FT01 excavation base (1995)	1,400	18AAC 75 <sup>b</sup>
Benzene	<b>32</b>	FT01 excavation base (1995)	0.2	18AAC 75 <sup>a</sup>
Ethylbenzene	<b>83</b>	FT01 excavation base (1995)	55	18AAC 75 <sup>a</sup>
Toluene	<b>270</b>	FT01 excavation base (1995)	54	18AAC 75 <sup>a</sup>
Xylenes	380	FT01 excavation base (1995)	780	18AAC 75 <sup>a</sup>
PCE	<b>0.129</b>	ESMW-1B (11' bgs) (1994)	0.03	18AAC 75

*Definitions and Notes:*

18AAC75 = Oil and Hazardous Substances Pollution Control Regulations (ADEC, 2003)

RAO = remedial action objectives bgs = below ground surface

DRO = diesel-range organics GRO = gasoline-range organics

EDB = 1,2-dibromoethane (ethylene dibromide)

PCE = tetrachloroethene

mg/kg = milligrams per kilogram mg/L = milligrams per liter

<sup>a</sup> 18 AAC 75 with application of the *ten times rule*.

<sup>b</sup> 18 AAC 75 with application of the *ten times rule* defaults to the ingestion/inhalation cleanup level of 1,400 mg/kg for GRO.

<sup>c</sup> 18 AAC 75 calculated cleanup level (provided in ADEC Tech Memo 01-007).

Detections above cleanup levels are shown in **bold font**.

**Remedial Alternatives Evaluated**

In the 1997 KSA FS, the following five remedial

alternatives were evaluated for addressing contamination at Fire Training Area No. 1.

- No Action.
- Excavation and Biocell Treatment of Soil, Focused *Air Sparging/SVE* with Intrinsic Remediation (*MNA*) of Groundwater, and Managed Wetlands.
- *Bioventing* of Soil, Intrinsic Remediation (*MNA*) of Groundwater, and Managed Wetlands.
- *Bioventing* of Soil, *Air Sparging/SVE* of Groundwater, and Managed Wetlands.
- Excavation and Thermal Treatment of Contaminated Soil, Extraction and Treatment of Groundwater Using an Air Stripper and Activated Carbon, and Managed Wetlands.

#### Proposed Remedy

Contamination remaining at Fire Training Area No. 1, if left untreated, is considered to pose an unacceptable risk to human health and the environment. After careful consideration of the above remedial alternatives, the proposed remedy for the site was selected by *USAF* with concurrence from *ADEC*.

The final remedy proposed for this site includes the following components:

#### Soil

- Natural attenuation of contaminated soil with future soil sampling to confirm that *cleanup levels* have been achieved, and
- Implementation of the following *Institutional controls (ICs)* to prevent human contact with contaminated soil during remediation (e.g., *ICs* will restrict excavations and other subsurface activities at the site during remediation):
  - *ICs* will be documented in the King Salmon Base General Plan, and appropriate notice only will be filed in appropriate state land records.
  - *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from Fire

Training Area No. 1.

- Periodic visual inspections will be performed to verify effectiveness of the *ICs*.

#### Groundwater

- *MNA* with long-term groundwater monitoring (initially performed annually) until *cleanup levels* are achieved, and
- *ICs* will be documented in the King Salmon Base General Plan and appropriate notice only will be filed in appropriate state land records to restrict the drilling of drinking water wells as long as the *ten times rule* is in effect.
  - *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
- Periodic visual inspections will be performed to verify effectiveness of the *ICs*.

After cleanup levels have been achieved, *ICs* with *NFRAP* status will be noted in *USAF* and *ADEC* records for Fire Training Area No. 1.

The estimated total present worth cost for the proposed remedy is \$420,000 to \$1,600,000.

The proposed remedy outlined above is considered to best meet the site cleanup objectives and *NCP* evaluation criteria. Natural attenuation of remaining soil contamination and *MNA* of groundwater contamination is considered to be the most appropriate remedy for the relatively small amount of contamination remaining at Fire Training Area No. 1. The no action alternative is not protective of human health or the environment. Further excavation, *bioventing*, or *SVE* would not significantly enhance remediation, because most of the source area was removed during the 1995 excavation; furthermore, the contamination remaining is near or below the water table and therefore difficult to excavate.



## RAPCON (FT001)

### Site Description

The RAPCON building was located approximately 600 feet southwest of Fire Training Area No. 1 approximately 2,000 feet north of Runway 29 and 1,500 feet east of Runway 36. Contamination at RAPCON is associated with a former underground storage tank and solvent use.

### Cleanup Actions To-Date

In 1997, due to impacts at Red Fox Creek, approximately 3,600 cubic yards of petroleum-impacted soils were removed from RAPCON. Contaminated soil was excavated down to groundwater; *free product* on the exposed groundwater was skimmed using sorbent boom materials. Excavated soils were treated in

bioremediation treatment cells at KSAS.

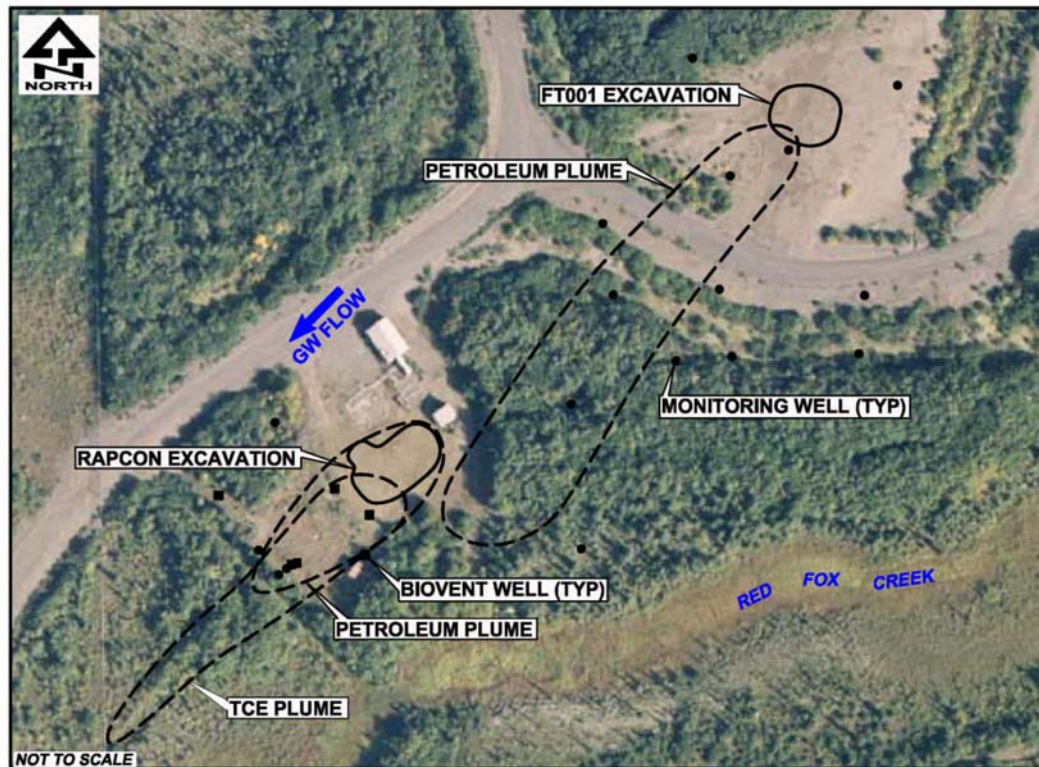
In 1998, a *soil vapor extraction (SVE)* and *air sparging (AS)* system was installed to remediate the contaminated soil and groundwater. The *SVE/AS* system operated intermittently during the summers between 1999 and 2002. In fall 2002, the *SVE/AS* system was converted to a *bioventing* system, which continues to operate.

### Summary of Site Conditions

Based on the 1993-94 *RI* and follow up sampling conducted between 1994 and 1997, petroleum hydrocarbon (*DRO, GRO, and BTEX*) and chlorinated solvent (primarily *TCE*) contamination of soil and groundwater is associated with RAPCON.

#### Soil Contamination:

The RAPCON soil excavation removed the areas of highest contamination. Most of the



FT001/RAPCON

remaining soil contamination is located near the *water table* (approximately 7 to 10 feet *bgs*) and is related to the groundwater contamination, e.g., the soil contamination indicates a *smear zone* where free phase product migrated with groundwater and became trapped in the subsurface soil near the *water table*. The existing bioventing system is addressing the *smear zone*, which is the remaining source area for the petroleum contamination in groundwater.

#### Petroleum Hydrocarbon Plumes:

The FT001/RAPCON figure depicts the RAPCON petroleum hydrocarbon plume based on the 2002-2003 sampling events, along with the Fire Training Area No. 1 plume discussed on page 14.

#### TCE Plume:

The FT001/RAPCON figure depicts the RAPCON TCE plume based on the 2002/2003 sampling events. TCE contamination has migrated across the small drainage ditch that flows into Red Fox Creek.

#### Red Fox Creek and the Drainage Ditch That Flows Into It:

Petroleum hydrocarbon constituents (e.g., *benzene*, *ethylbenzene*, *xylenes*, and several *PAHs*) have impacted sediments at levels above *SSLs* in the drainage adjacent to RAPCON that flows into Red Fox Creek and, to a much lesser extent, in Red Fox Creek downstream of the drainage. In 1995 and 1996, *benzene*, *total aromatic hydrocarbons (TAH)*, and *total aqueous hydrocarbons (TAqH)* were detected above the *surface water criteria* in samples from the drainage adjacent to RAPCON. However, no contaminants have been detected above surface water criteria since then.

To investigate effects of surface water and sediment contamination on living organisms, plant tissue and fish tissue samples were collected from Red Fox Creek in 1996 and 1997. Several chemicals were detected in plant and fish tissue samples at concentrations below EPA and ADEC target risk levels for human ingestion, and that uptake of contamination into

ecological receptors has not occurred.

#### **RAPCON Cleanup Objectives**

The cleanup objectives for RAPCON are to:

- Clean up contaminated soil and groundwater to the applicable *cleanup levels* (summarized in Table 4);
- Restrict access to contaminated soil and groundwater until it is cleaned up;
- Protect Red Fox Creek from contamination migrating into it; and
- Restrict the use of the unconfined aquifer as a drinking water source during and after remediation, as long as the *ten times rule* is in effect.

RAPCON cleanup levels are provided in Table 4. As shown in Table 4, the *cleanup levels* for contaminants detected in groundwater have been modified by the *ten times rule*. 18 AAC 75 indicates that groundwater closely connected to surface water meet the *surface water quality standards* (18 AAC 70).

#### **Remedial Alternatives Evaluated**

In the most recent *Feasibility Study (FS)* (1997), the following four remedial alternatives were evaluated for addressing contamination at RAPCON. Note that the RAPCON soil excavation occurred after completion of the 1997 *FS*.

- No Action.
- Excavation and Biocell Treatment of Soil, Intrinsic Remediation (*MNA*) of Groundwater, and Managed Wetlands.
- Bioventing of Soil, Intrinsic Remediation of Soil and Groundwater (*MNA*), and Managed Wetlands.
- Excavation and Thermal Treatment of Contaminated Soil, Extraction and Treatment of Groundwater Using an Air Stripper and Activated Carbon, and Managed Wetlands.

**Proposed Plan for Final Remedial Action(s) at Landfills and Fire Training Areas in Groundwater Zone 5 -  
King Salmon Air Station**

### Proposed Remedy

Contamination detected at RAPCON, if left untreated, is considered to pose an unacceptable risk to human health and the environment. After careful consideration of the above remedial alternatives, the proposed remedy for the site was selected by **USAF** with concurrence from **ADEC**.

The final remedy proposed for this site includes the following components:

### Soil

- Continuation of the **bioventing** currently underway (including annual soil gas monitoring) until cleanup levels are met or until the remediation is no longer technically or economically feasible. If bioventing is discontinued before **cleanup levels** are met, the remaining contamination will be addressed by natural attenuation, which is discussed further in the following bullet.
- Natural attenuation of contaminated soil outside of the bioventing area with future soil sampling to confirm that cleanup levels have been achieved, and

**Table 4: RAPCON Clean Up Levels**

Site Data			Regulatory Criteria		Proposed RAOs
Contaminants of Concern	Maximum Conc. (Location -Date)	Maximum Conc. 2002-2003 data	ADEC Regulatory Criteria	Basis	Proposed Cleanup Level
<b>Groundwater (mg/L)</b>					
DRO	<b>43.2</b> (GP-9 -1996)	<b>22.7</b> VM (MW-02)	1.5	18AAC75	15 <sup>a</sup>
GRO	<b>21</b> (GP-9 -1996)	12.8 (SVE-2)	1.3	18AAC75	13 <sup>a</sup>
Benzene	<b>1.43</b> Y (GP-9 -1996)	<b>0.0865</b> (SVE-2)	0.005	18AAC75	0.05 <sup>a</sup>
Toluene	8.19Y (GP-9 -1996)	2.06VJ (SVE-2)	1	18AAC75	10 <sup>a</sup>
Ethylbenzene	0.706 (GP-9 -1995)	0.274 (SVE-2)	0.7	18AAC75	7.0 <sup>a</sup>
TCE	<b>0.636</b> (GP-9 -1995)	<b>0.108</b> (SVE-2)	0.005	18AAC75	0.05 <sup>a</sup>
EDB	<b>0.0949</b> Y (GP-9 -1996)	<b>0.0031</b> (SVE-2)	0.00005	18AAC75	0.0005 <sup>c</sup>
<b>Surface Water (mg/L)</b>					
Benzene	0.113 (SW-1 -1996)	ND	0.005	18AAC70	0.005
TAH	2.026 (SW-1 -1996)	ND	0.01	18AAC70	0.01
TAqH	2.026* (SW-1 -1996)	ND	0.015	18AAC70	0.015
<b>Soil (mg/kg)</b>					
DRO	<b>9,240</b> (VP-2 (5' bgs) - 1998)	NS	250	18AAC75	2,500 <sup>a</sup>
GRO	<b>4,900</b> (RAPCON Excavation sidewall - 1997)	NS	300	18AAC75	1,400 <sup>c</sup>
Benzene	<b>14.3</b> (RAPCON Excavation sidewall - 1997)	NS	0.02	18AAC75	0.2 <sup>a</sup>
Ethylbenzene	<b>76.9</b> (RAPCON Excavation sidewall - 1997)	NS	5.5	18AAC75	55 <sup>a</sup>
Toluene	<b>244</b> (RAPCON Excavation sidewall - 1997)	NS	5.4	18AAC75	54 <sup>a</sup>
Xylenes	<b>422</b> (RAPCON excavation sidewall - 1997)	NS	78	18AAC75	780 <sup>a</sup>
TCE	0.26 (AS-5 (10' bgs) - 1998)	NS	0.027	18AAC75	0.27 <sup>a</sup>
PCE	<b>2.19</b> (VP-2 (5' bgs) - 1998)	NS	.03	18AAC75	0.03

**Definitions:**

18AAC75 = Oil and Hazardous Substances Pollution Control Regulations (ADEC, 2003)  
 18AAC70 = Alaska Water Quality Standards (ADEC, 2003)  
 RAO = remedial action objectives  
 GRO = gasoline-range organics  
 PCE = tetrachloroethene  
 ND = not detected  
 mg/L = milligrams per liter  
 bgs = below ground surface  
 VJ = estimated result  
 DRO = diesel-range organics  
 TCE = trichloroethene  
 EDB = 1,2-dibromoethane (ethylene dibromide)  
 NS = Not sampled  
 mg/kg = milligrams per kilogram  
 VM = result is estimated due to matrix effect  
 Y = samples received at pH>2

<sup>a</sup> 18 AAC 75 with application of the ten times rule.

<sup>b</sup> 18 AAC 75 with application of the ten times rule defaults to the ingestion/inhalation cleanup level of 1,400 mg/kg for GRO.

<sup>c</sup> 18 AAC 75 calculated cleanup level (provided in ADEC Tech Memo 01-007).

Detections above cleanup levels are shown in **bold font**.

- Implementation of the following *Institutional controls (ICs)* to prevent human contact with contaminated soil during remediation (e.g., *ICs* will restrict excavations and other subsurface activities at the site during remediation):
  - *ICs* will be documented in the King Salmon Base General Plan, and appropriate notice only will be filed in appropriate state land records.
  - *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from Fire Training Area No. 1.
  - Periodic visual inspections will be performed to verify effectiveness of the *ICs*.

#### Groundwater

- *MNA* with long-term groundwater monitoring (initially performed annually) until cleanup levels are achieved, and
- *ICs* will be documented in the King Salmon Base General Plan and appropriate notice only will be filed in appropriate state land records to restrict the drilling of drinking water wells as long as the *ten times rule* is in effect.
  - *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
  - Periodic visual inspections will be performed to verify effectiveness of the *ICs*.

#### Red Fox Creek/Wetlands

- Surface water and sediment sampling (initially performed annually) to monitor sediment concentrations for decreasing trends and to confirm that surface water concentrations remain below *cleanup levels*. Surface water and sediment sampling may be discontinued when all surface water results are below *cleanup levels* for two consecutive sampling events.

After *cleanup levels* have been achieved, *ICs*

with *NFRAP* status will be noted in *USAF* and *ADEC* records for *RAPCON*.

The estimated total present worth cost for the proposed remedy is \$1,000,000 to \$2,300,000.

The proposed remedy outlined above is considered to best meet the site cleanup objectives and *NCP* evaluation criteria. *Bioventing* is effectively addressing soil contamination remaining after the 1997 excavation. Further excavation would not significantly enhance remediation, because most of the source area was removed during the 1997 excavation; furthermore, the contamination remaining is near or below the water table and therefore difficult to excavate. *MNA* of groundwater is considered to be the most appropriate remedy for the groundwater, since groundwater extraction and treatment would not result in a more timely cleanup. The no action alternative is not protective of human health or the environment.

## FIRE TRAINING AREA NO. 2 (FT002)

### Site Description

FT002 (Fire Training Area No. 2) is located on abandoned airfield pavement, approximately 800 feet north of the centerline of Runway 11/29. The fire training area was reportedly used for training in fighting structural fires from approximately 1979 to 1984.

### Cleanup Actions To-Date

In 1996, approximately 1 cubic yard of contaminated soil was removed from a stained area at FT002. Excavated soils were treated in bioremediation treatment cells at KSAS.

### Summary of Site Conditions

Based on the most recent soil sampling (1993 and excavation confirmation sampling from 1996), small areas of soil were impacted by *DRO* above *cleanup levels*. No groundwater contamination was detected above *cleanup levels* in the limited groundwater sampling performed in 1993.

### Fire Training Area No. 2 Cleanup Objectives

The cleanup objectives for Fire Training Area No. 2 are dependent upon the results of updated sampling.

If no soil or groundwater contamination is detected above *cleanup levels* in the updated sampling, no cleanup will be necessary to restore the site to unrestricted use.

If there is soil or groundwater contamination above *cleanup levels* in the updated sampling, the following cleanup objectives apply:

- Clean up soil and groundwater to the applicable *cleanup levels* (summarized in Table 5); and
- Restrict access to contaminated soil and groundwater until it is cleaned up.



FT002

Table 5: Fire Training Area No. 2 Soil Cleanup Levels

Contaminant of Concern	Maximum Concentration (mg/kg)	Maximum Concentration (Location) (Date)	Proposed RAO (mg/kg)	Basis
DRO	9,890	S01 (1.6' bgs) (1996)	250	18AAC 75

**Definitions:**

18AAC75 =

Oil and Hazardous Substances Pollution Control Regulations (ADEC, 2003)

RAO = remedial action objectives

DRO = diesel-range organics

bgs = below ground surface

mg/kg = milligrams per kilogram

- If *ten times rule cleanup levels* are used, restrict the use of the unconfined aquifer as a drinking water source during and after remediation, as long as the *ten times rule* is in effect.

Cleanup levels for Fire Training Area No. 2 are provided in Table 5.

### Remedial Alternatives Evaluated

FT002 is sufficiently similar to FT001 that the remedial alternatives examined for FT001 are applicable to this site.

### Proposed Remedy

The existing monitoring well will be sampled, along with the minimum number of new monitoring wells or well points needed to characterize the site. Soil samples will be taken from areas previously showing contamination above *cleanup levels* (see Figure).

- If there is no contamination above *cleanup levels*, then no further action will be required at FT002 and the *site* will be closed.
- If there is groundwater contamination above *cleanup levels*, the *cleanup levels* will be revised by application of the *ten times rule*. Groundwater will be remedied by *MNA* with long-term groundwater monitoring (initially performed annually) until *cleanup levels* are achieved and *Institutional Controls* with *NFRAP* will be noted in USAF and ADEC records for this site.
  - *ICs* will be documented in the King Salmon Base General Plan and appropriate notice only will be filed in appropriate state land records to restrict the drilling of drinking water wells during and after remediation, as long as the *ten times rule* is in effect.
  - *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
  - Periodic visual inspections will be performed to verify effectiveness of the *ICs*.
- If there is soil contamination above *cleanup levels*, up to 200 cubic yards of soil will be excavated and treated in a bioremediation treatment cell to *cleanup levels* appropriate for the final disposition area within KSAS.

The estimated total present worth cost for the proposed remedy, including excavation if necessary, is \$38,000 (without excavation or groundwater *MNA*) to \$1,200,000 (with excavation and groundwater *MNA*).

The proposed remedy outlined above is considered to best meet the site cleanup objectives and *NCP* evaluation criteria. The no action alternative will be selected if no contamination is found above cleanup levels.

- If soil contamination above *cleanup levels* is found, contaminated soil will be removed. Because the volume of soil contamination is expected to be small, excavation and biocell treatment is the most efficient remedy. Biocell treatment has proven to be an effective treatment method for contaminated soil at KSAS.
- If groundwater contamination above cleanup levels is found, *MNA* of groundwater is considered to be the most appropriate remedy for the groundwater, since groundwater extraction and treatment would not result in a more timely cleanup.



## FIRE TRAINING AREA NO. 3. (FT003)

### Site Description

FT003 (Fire Training Area No. 3) is located both on and off abandoned airfield pavement approximately 400 feet north of the centerline of Runway 11/20. The fire training area was reportedly used in the late 1970s to simulate fighting structural fires.

### Cleanup Actions To-Date

In 1996, approximately 85 cubic yards of contaminated soil were removed from a stained area at FT003. Excavated soils were treated in bioremediation treatment cells at KSAS.

### Summary of Site Conditions

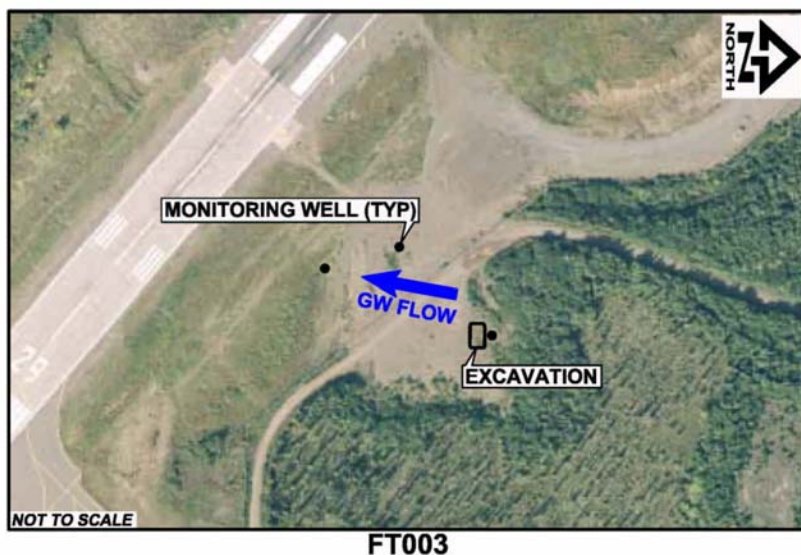
Based on the most recent soil sampling (1993 and excavation confirmation sampling from 1996), contamination levels remaining in FT003 soil do not pose an unacceptable risk to human health or the environment.

### Fire Training Area No. 3 Cleanup Objectives

There were no contaminants detected above regulatory levels in FT003 soil and groundwater; therefore the only objective for this site is *site closure*. Land use at Fire Training Area No. 3 will be unrestricted.

### Proposed Remedy

There is no further action required to protect human health or the environment at FT003. No action and *site closure* is proposed.





## FIRE TRAINING AREA NO. 4 (FT004)

### Site Description

FT004 (Fire Training Area No. 4) is located approximately 1,600 feet northeast of the centerline of Runway 29. The fire training area is a circular sand pit approximately 50 feet in diameter, located partially on and partially off of abandoned airfield pavement. It was reportedly used for several years until 1980 for training in fighting aircraft fires.

### Cleanup Actions To-Date

No cleanup actions have been performed to-date.

### Summary of Site Conditions

Based on the most recent soil sampling (1993 and 1997), soil impacted by *DRO*, *benzene*, and *TCE* and groundwater impacted by *benzene*, *TCE*, and *ethylene dibromide (EDB)* above cleanup levels remains at FT004. Based on the 1993 and 1997 sampling data, the estimated areal extent of soil contamination is approximately 2,800 square feet, and the estimated volume of contaminated soil is approximately 1,200 cubic yards.

### Fire Training Area No. 4 Cleanup Objectives

The cleanup objectives for Fire Training Area No. 4 are dependent upon the results of updated sampling.

If no soil or groundwater contamination is detected above *cleanup levels* in the updated



FT004

sampling, the only cleanup objective would be to restrict the use of the unconfined aquifer as a drinking water source as long as the *ten times rule* is in effect.

If there is soil or groundwater contamination above *cleanup levels* in the updated sampling, the following cleanup objectives apply:

- Clean up soil and groundwater to the applicable *cleanup levels* (summarized in Table 6);
- Restrict access to contaminated soil and groundwater until it is cleaned up; and
- Restrict the use of the unconfined aquifer as a drinking water source during and after remediation as long as the *ten times rule* is in effect.

Fire Training Area No. 4 *cleanup levels* are provided in Table 6. As shown in Table 6, the *cleanup levels* for contaminants detected in groundwater have been modified by the *ten times rule*.

### Remedial Alternatives Evaluated

In the most recent *FS* (1997), the following four remedial alternatives were evaluated for addressing contamination at FT004.

- No Action.
- Excavation and Biocell Treatment of Surface Soil, and Intrinsic Remediation of Subsurface Soil and Groundwater (*MNA*).
- Intrinsic Remediation of Soil and Groundwater (*MNA*).
- Excavation and Thermal Treatment of Contaminated Soil, Extraction and Treatment of Groundwater Using an Air Stripper and Activated Carbon, and Managed Wetlands.

**Table 6: Fire Training Area No. 4 Cleanup Levels**

Contaminant of Concern	Maximum Concentration	Maximum Concentration (Location) (Date)	Proposed RAO (mg/kg)	Basis
<b>Soil (mg/kg)</b>				
DRO	<b>20,860</b>	SS02 (surface soil) (1996)	2,500	18AAC75 <sup>a</sup>
Benzene	<b>0.8</b>	FT004B (10-11.5' bgs) (1993)	0.2	18AAC75 <sup>a</sup>
TCE	<b>0.64</b>	FT004A (10' bgs) (1993)	0.27	18AAC75 <sup>a</sup>
<b>Groundwater (mg/L)</b>				
Benzene	<b>0.292</b>	FT04-MW2 (1997)	0.05	18AAC75 <sup>a</sup>
TCE	<b>0.137</b>	FT04-MW5 (1996)	0.05	18AAC75 <sup>a</sup>
EDB	<b>0.00237</b>	FT04-MW2 (1996)	0.0005	18AAC75 <sup>b</sup>

**Definitions:**

18AAC75 = Oil and Hazardous Substances Pollution Control Regulations (ADEC, 2003)

18AAC70 = Alaska Water Quality Standards (ADEC, 2003)

RAO = remedial action objectives

GRO = gasoline-range organics

EDB = 1,2-dibromoethane (ethylene dibromide)

mg/L = milligrams per liter

bgs = below ground surface

<sup>a</sup> 18 AAC 75 with application of the ten times rule.

<sup>b</sup> 18 AAC 75 calculated cleanup level (provided in ADEC Tech Memo 01-007).

Detections above cleanup levels are shown in **bold font**

### Proposed Remedy

The existing wells will be sampled, along with the minimum number of new monitoring wells or well points needed to characterize the site. Soil samples will be taken from areas previously showing contamination above *cleanup levels* (see FT004 figure).

- If there is no contamination above cleanup levels, then no further action will be required at FT004, and *NFRAP* with *Institutional Controls (ICs)* to restrict the drilling of drinking water wells (as long as the *ten times rule* is in effect) will be noted in USAF and ADEC records for the site.
- If there is groundwater contamination above cleanup levels, it will be remedied by *MNA* with long-term groundwater monitoring (initially performed annually) until *cleanup*

*levels* are achieved and *NFRAP* with *ICs* (described below) will be appropriate.

- *ICs* will be documented in the King Salmon Base General Plan and appropriate notice only will be filed in appropriate state land records to restrict the drilling of drinking water wells during and after remediation, as long as the *ten times rule* is in effect.
- *USAF's* dig permit and construction review system will be utilized to restrict incompatible activities from the landfill.
- Periodic visual inspections will be performed to verify effectiveness of the *ICs*.
- If there is soil contamination above cleanup levels, up to 1,200 cubic yards of soil will be excavated and treated in a bioremediation treatment cell to *cleanup levels* appropriate for the final disposition area within KSAS. After soil excavation and treatment has been completed, *NFRAP* with *ICs* (described above) will be noted in *USAF* and *ADEC* records for the site.

The estimated total present worth cost for the proposed remedy, including excavation if necessary, is \$460,000 to \$1,300,000.

The proposed remedy outlined above is considered to best meet the site cleanup objectives and *NCP* evaluation criteria. The no action alternative will be selected if no contamination is found above *cleanup levels*.

- If soil contamination above *cleanup levels* is found, contaminated soil will be removed. Because the volume of soil contamination is expected to be small, excavation and biocell treatment is the most efficient remedy. Biocell treatment has proven to be an effective treatment method for contaminated soil at KSAS.
- If groundwater contamination above *cleanup levels* is found, *MNA* is considered to be the most appropriate remedy for the groundwater, since groundwater extraction and treatment would not result in a more timely cleanup.

## OT031

### Background

Groundwater contamination at *KSAS* has been consolidated into five zones with common hydrological, geographical, and contamination characteristics. Groundwater Zone 5 (OT031) contains the former fire training areas and landfills considered in this Proposed Plan. Instead of presenting the proposed remedy for OT031 groundwater separately, the remedies for groundwater at each landfill or fire training area are discussed along with the remedies for soil and wetlands at each respective landfill or fire training area.

### Proposed Action

Administrative closure to eliminate OT031 as a site in *USAF* and *ADEC* records.

## PUBLIC PARTICIPATION REQUEST

USAF and ADEC would like community participants to review and comment on this *Proposed Plan* and its recommendations. The final decision for these sites will not be made until after your comments are considered if you provide them within the 30-day review period. After consideration of comments, USAF will publish the decision for each site in a final Record of Decision (ROD). All comments (and responses) received by the USAF will be summarized in a *Responsiveness Summary*, to be included in the ROD.

Your comments can be presented in writing, via e-mail, or at the public meeting on **Tuesday, April 27, 2004**. The public comment period is from March 27 to May 7, 2004.

For your convenience, an addressed comment form has been included at the end of this publication for return with comments by mail.

If you have questions or wish to provide comments on this project, please contact one of the following people:

**Mr. Steven Wilhelmi, USAF Community Relations,**  
at (800) 222-4137  
(email: [steven.wilhelmi@elmendorf.af.mil](mailto:steven.wilhelmi@elmendorf.af.mil)); or

**Mr. David Hertzog, USAF Project Manager, at**  
(907) 552-7261  
(email: [dave.hertzog@elmendorf.af.mil](mailto:dave.hertzog@elmendorf.af.mil)); or

**Ms. Gretchen Pikul (ADEC) at (907) 269-3077**  
(email: [gretchen\\_pikul@dec.state.ak.us](mailto:gretchen_pikul@dec.state.ak.us)).

### If you would like more information about this project:

All reports relating to this project have been given to the King Salmon **Restoration Advisory Board (RAB)**. The **RAB** meetings are held the third Tuesday evening of every month to accommodate community participation. Interested members of the public are encouraged to attend. The meetings are held at the King Salmon Air Station lounge at 7 p.m.

The reports are also available at the King Salmon Air Station Information Repository located in the Fire Station. The repository is open to the public Monday to Friday 8 a.m. to 4:30 p.m. A complete record of all information related to the site is stored in the **Administrative Record** located at Elmendorf Air Force Base. The **Administrative Record** is open to the public during normal working hours.

Contact Steve Wilhelmi, **USAF** Community Relations Coordinator, at (800) 222-4137 to view the **KSAS IRP Administrative Record**.

## GLOSSARY OF TERMS

**Administrative Record** - A file that contains information used by the USAF to decide on the cleanup for an IRP site. This file is available for public review.

**Air Sparging (AS)** - A groundwater cleanup technique in which air is injected into contaminated groundwater. The air bubbles act as an air stripper for removing volatile contaminants from the groundwater.

**Aquifer** - Rock or sediment in a formation that is capable of transmitting significant quantities of water. Common aquifer material includes mixtures of sand, silt, and gravel.

**Aquitard** - A geologic unit that is relatively difficult for water to penetrate. Aquitards may be capable of transmitting water, but generally not in the quantities necessary for a water production well. Common aquitard material includes silt and clay.

**Alaska Department of Environmental Conservation (ADEC)** - the lead regulatory agency for KSAS.

**Applicable or Relevant and Appropriate Requirements (ARARs)** - Laws and regulations that establish cleanup levels for sites with contamination. ARARs include cleanup standards, standards of control, and other environmental protection criteria as specified under federal and state statutes and regulations. ARARs must be met (or a waiver approved) at a site to comply with CERCLA.

**AST** - Above ground storage tank.

**bgs** - Below ground surface.

**Benzene** - A colorless, volatile, inflammable, carcinogenic liquid ( $C_6H_6$ ) used in a variety of chemical products, including motor fuel. Compounds containing benzene are called aromatic compounds.

**Benzene, toluene, ethylbenzene, and xylene (BTEX)** - Volatile organic chemicals (aromatic compounds) that are constituents of petroleum products.

**Bioventing** - A remedial technique in which air injection wells are installed in areas of soil

contamination. Air injected into the wells provides oxygen for the resident bacteria to enhance natural biodegradation.

**Cleanup level** - The concentration of a hazardous substance that may be present within a specified medium (i.e., soil, groundwater, or surface water) without posing an unacceptable risk to human health, safety, welfare, or the environment. ADEC provides tabulated cleanup levels in 18 AAC 75 that are applicable to contaminated soil and groundwater sites in Alaska.

**1,2-Dibromoethane (EDB)** - Also called ethylene dibromide ( $C_2H_4Br_2$ ); a colorless, heavy organic liquid with a mildly sweet chloroform-like odor. Ethylene dibromide is mainly used in anti-knock gasoline mixtures, particularly in aviation fuel.

**Diesel-range organics (DRO)** - A mixture of organic compounds found in diesel fuel, jet fuel, and heating oil. Polynuclear aromatic hydrocarbons (PAHs), such as naphthalene, are included in this range. DRO are generally less volatile and less soluble than GRO.

**Ecological screening level** - Screening ecological benchmarks are used to identify chemical concentrations in environmental media that are at or below thresholds for effects to ecological receptors. Screening benchmarks have been compiled by several sources, including the Oak Ridge National Laboratory (ORNL) and the National Oceanic and Atmospheric Association (NOAA).

**Ethylbenzene** - A colorless, volatile, flammable organic liquid ( $C_8H_{10}$ ) with a sweet, gasoline-like odor used in a variety of chemical products, including motor fuel.

**Ethylene Dibromide (EDB)** - see 1,2-Dibromoethane

**EPA** - United States Environmental Protection Agency.

**Five-year review** - A review of any cleanup actions that result in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure. Reviews are performed within five years following the initiation of a CERCLA response action, and are repeated every succeeding five years so long as

future uses remain restricted. The five-year review can be used to recommend modifications to the treatment, monitoring frequency, and other remedial actions.

**Feasibility Study (FS)** - An evaluation of site conditions and potentially applicable remedial actions.

**Free product** - Petroleum product that is present in sufficient quantity to be mobile in the subsurface. Free product is lighter than water and is only partially soluble in water. If present in sufficient quantity, it forms a layer on top of the water table that will rise when the water table rises and fall when the water table falls, creating a **smear zone**.

**Gasoline-range organics (GRO)** - A mixture of organic compounds found in gasoline.

**Hazardous substance** - A chemical that presents an imminent and substantial danger to the public health or welfare if it is released to the atmosphere, surface water, groundwater, or land surface. Regulatory definitions can be found in CERCLA § 101(14) and 102 and in the NCP40 CFR § 300.5.

**Installation Restoration Program (IRP)** - The USAF's CERCLA program.

**Institutional Controls (ICs)** - Any type of physical, legal, or administrative mechanism to restrict the use of, or limit access to, real property to prevent exposure to contaminants above permissible levels. The intent of the controls is to protect human health, the environment, and the integrity of an engineering remedy by limiting the activities that may occur at a particular site. Common examples of ICs include physical barriers to a site (e.g., fences and signs) and land use restrictions (e.g., restricting the installation of drinking water wells).

**KSAS** - King Salmon Air Station

**Landfill Cover or Cap** - The presumptive remedy for landfills. A landfill cap is a soil cover or cover of low permeability material that is installed over a landfill as a protective covering to protect the landfill from surface water infiltration and reduce the potential for contaminants contained within buried debris to leach into nearby groundwater.

**Method 2 Cleanup Levels** - In 18 AAC 75, the State of Alaska provides four possible methods for determining soil cleanup levels. Method 2 utilizes tabulated cleanup levels (Table B1 and Table B2 for soil and Table C for groundwater) that must be met for site closure. Meeting the tabulated cleanup levels is considered to be protective of human health.

**Milligram per kilogram (mg/kg)** - A solid concentration measurement. One milligram of a substance in 1 kilogram of soil, which is also equal to a concentration of 1 *ppm* for that substance in soil (see definition for parts per million).

**Milligram per liter (mg/L)** - A liquid concentration measurement. One milligram of a substance in 1 liter of water is also equal to a concentration of 1 *ppm* in water (see definition for *parts per million*).

**Monitored Natural Attenuation (MNA)** - An environmental cleanup strategy in which naturally occurring processes (also known as intrinsic remediation) are allowed to cleanup contaminants. Environmental sampling is used to monitor the cleanup process.

**National Contingency Plan (NCP)** - The regulations that provide the structure and procedures for responding to discharges of oil and hazardous substances, as directed by CERCLA.

**No Further Response Action Planned (NFRAP)** - A category of site response that identifies that no further remedial response activity is necessary to protect human health and the environment; thus no further remedial action will be performed there. *NFRAP* differs from *site closure* in that *NFRAP* sites require *institutional controls* to restrict access to contamination remaining at the site; whereas closed sites are available for unrestricted use and access. *NFRAP* sites are tracked in USAF and ADEC databases

**Parts per million (ppm)** - A unit of measure used to express extremely low concentrations of chemicals in media such as soil or water. As an analogy, one ounce of a chemical in a million ounces of water is 1 ppm and is also equivalent to 12 seconds of time in a period of 12 days. Equivalent units for 1 *ppm* can be expressed as 1 mg/L (water) or 1 mg/Kg (soil).

**PCE** - see tetrachloroethene



**Polyaromatic (or Polycyclic) Hydrocarbons (PAHs)**

- A class of very stable organic molecules made up of only carbon and hydrogen (benzene rings). They occur naturally in crude oil and refined products (such as diesel fuel) and also occur as products of incomplete combustion. Some PAHs are highly carcinogenic (e.g., benzo(a)pyrene).

**Polychlorinated biphenyls (PCBs)** - A group of toxic, persistent chemicals used in transformers and capacitors for insulating purposes and in gas pipeline systems as a lubricant.

**Proposed Plan** - A document required by section 117(a) of CERCLA that informs the public about alternatives that are considered for cleanup of a contaminated site and identifies a preferred cleanup alternative. The document encourages public comment on all alternatives.

**Record of Decision (ROD)** - As required by CERCLA section 117(b), a document of the final cleanup decision under the site cleanup rules. The ROD documents the rationale for selection of the cleanup remedy and establishes performance goals for achieving cleanup. A ROD issued by or for ADEC is similar to a USAF Decision Document or an EPA ROD, but its format may differ. The format for an ADEC ROD is specified in the *ADEC Guidance on Decision Documentation Under the Site Cleanup Rules* (July 1999).

**Residual Range Organics (RRO)** - heavy-range petroleum products such as lubricating oils, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C25 to the beginning of C36 and a boiling point range between approximately 400° C and 500° C (definition from 18AAC75.341)

**Restoration Advisory Board (RAB)** - An advisory body with diverse community representation designed to act as a focal point for the exchange of information between the USAF and interested stakeholders.

**Remedial Action** - Action taken to permanently eliminate, reduce, or control the hazards posed by hazardous substances, pollutants or contaminants at a site.

**Responsiveness Summary** - A summary of oral

and/or written public comments received during a comment period and the responses to those comments. The responsiveness summary is part of the decision document or ROD.

**Remedial Investigation/Feasibility Study (RI/FS)** - An evaluation of site conditions (RI) and potentially applicable remedial actions (FS).

**Sediment Benchmark Screening Levels (SSL0** - Benchmark screening levels are used to identify chemical concentrations in environmental media that are at or below thresholds for effects to ecological receptors. Screening benchmarks have been compiled by several sources, including the EPA, Oak Ridge National Laboratory (ORNL), and the National Oceanic and Atmospheric Association (NOAA).

**Site Closure** - A written determination by ADEC that a site was adequately characterized and achieved the applicable requirements under the site cleanup rules (18 AAC 75.380(d)(1)).

**Soil Vapor Extraction (SVE)** - A soil cleanup technology in which a vacuum is applied to a series of extraction points installed in the soil.

**Smear Zone** - The smear zone refers to the zone of groundwater table fluctuation (e.g., from the highest seasonal water table to the lowest seasonal water table) when free-phase petroleum product is present. The petroleum product rises and falls with fluctuations in the water table, thereby "smearing" residual petroleum product throughout the soil in this zone.

**Surface Water Quality Standards** - Water quality standards published in 18 AAC 70 to protect surface waters of the State of Alaska.

**TAqH** - Total aqueous hydrocarbons (sum of BTEX and PAH concentrations); 18 AAC 70 stipulates that the highest level of TAqH allowed in surface water is 0.015 mg/L

**TAH** - Total aromatic hydrocarbons (sum of BTEX concentrations); 18 AAC 70 stipulates that the highest level of TAH allowed in surface water is 0.01 mg/L

**Tetrachloroethene (PCE)** - A chlorinated solvent that is widely used as dry cleaning solvent and is also used as a metal degreaser. Its chemical formula is C<sub>2</sub>Cl<sub>4</sub>, and it is heavier than water. It is colorless,

volatile, and nonflammable. Also known industrially as perchloroethylene and tetrachloroethylene.

**Ten Times Rule** - a provision set out in 18 AAC 75.350 that stipulates that cleanup levels may be adjusted in cases where groundwater is not considered drinking water. In order to use the ten times rule, groundwater must meet criteria set out in 18 AAC 75.350 considering the suitability of the aquifer for a drinking water source, historical and potential future use of the aquifer for a drinking water source, and the availability of alternative drinking water sources.

**Toluene** - A colorless, volatile, flammable liquid,  $C_7H_8$ , used in aviation fuel and other high-octane fuels, in dyestuffs, explosives, and as a solvent for gums and lacquers.

**Trichloroethene (TCE)** - A chlorinated solvent that is a widely used degreaser. Its chemical formula is  $C_2HCl_3$ , and it is heavier than water. It is colorless, volatile, and nonflammable. It is also known as trichloroethylene.

**UST** - Underground Storage Tank.

**USAF** - United States Air Force

**VOCs**- Volatile organic chemicals

**Water Table** - Practically speaking, the water level in a shallow well installed into an unconfined aquifer is the water table. The water table is defined as the surface on which fluid pressure in the pores of the aquifer is exactly atmospheric.

**Xylenes** - A group of colorless, volatile, flammable liquids ( $C_6H_{10}$ ) with a sweet odor that are used in a variety of products including motor fuel.

## 18 AAC 75.350

### Groundwater Use Determination -

ADEC and USAF agree that the A-Aquifer at landfill and fire training area sites within Groundwater Zone 5 (i.e., Circle Landfill [LF006], Landfill No. 3 [LF007], Fire Training Area No. 1 and RAPCON [FT001], Fire Training Area No. 2 [FT002], Fire Training Area No. 3 [FT003], and Fire Training Area No. 4 [FT004] collectively hereinafter referred to as landfills and fire training areas) meets the criteria stipulated in 18 AAC 75.350 to classify groundwater as a non-drinking water source.

The specific criteria spelled out in 18 AAC 75.350 are discussed below:

1. **Criterion** - The A-Aquifer groundwater may not be currently used for a public or private drinking water system.

**Basis** - Well searches have been performed, and there are no known drinking water wells in the A-Aquifer within the landfills and fire training areas. Furthermore, there are no known drinking water wells in any aquifer within the landfills and fire training areas.

2. **Criterion** - The A-Aquifer cannot be within the zone of contribution of any public or private drinking water well.

**Basis** - The closest known drinking water wells are completed in the C-Aquifer in the main base area (Groundwater Zone 1), approximately one mile west-northwest of the landfills and fire training areas. There are also drinking water wells completed in the B-Aquifer in the vicinity of the Bluffs and the Naknek River Storage area, which are approximately two miles from the landfills and fire training areas. The B-Aquifer is separated from the A-Aquifer by an aquitard, and the C-Aquifer is separated from the A-Aquifer by two aquitards and the B-Aquifer.

3. **Criterion** - The A-Aquifer at the landfills and fire training areas may not be within a recharge area for a private or public drinking water well, wellhead protection area, or a sole source aquifer.

**Basis** - The recharge area for the B- and C-Aquifers is not the A-Aquifer. It is assumed to be the highlands east of King Salmon.

4. **Criterion** - The A-Aquifer may not be a reasonably expected potential future source of drinking water based on the availability of groundwater, quality of the groundwater, existence and enforceability of institutional controls, land use of the site and neighboring property, need for a drinking water source and availability of an alternative source, and exemption of the groundwater under 40 CFR 146.4:

#### **Basis** -

- Although the A-Aquifer groundwater is of reasonable quality and availability, it is not currently and has not historically been used as a drinking water source at KSAS. The A-Aquifer groundwater is only 0- to 30-feet bgs and is therefore readily susceptible to impacts from the ground surface. The B- and C-Aquifers are much better drinking water sources than the A-Aquifer.
- The Air Force owns the property at the landfills and fire training areas and will institute a ban on all drinking water wells within specific sites in this zone (i.e., Fire Training Area No. 1 and RAPCON [FT001], Fire Training Area No. 4 [FT004], and Circle Landfill [LF006]) (per the 611<sup>th</sup> Air Support Group Base General Plan and state land records, "*The institutional controls will include limiting the installation of drinking water wells*"). This ban constitutes an institutional control that would remain with the property should the Air Force decide to dispose of it. Note that the Air Force has no plans to dispose of the property.

- The landfills and fire training areas are adjacent to the airport of the KSAS facility, and the Air Force has no plans for residential development in the area. All adjacent property is also owned by the Air Force.
  - The A-Aquifer is not needed nor is it desirable as a drinking water source. Both the B- and C-Aquifers are superior in terms of groundwater quality and available volume. KSAS utilizes the C-Aquifer for drinking water, and others in King Salmon use the B-Aquifer for drinking water. There is no residential or commercial development within the landfills and fire training areas and therefore no need for a drinking water source in the area.
5. **Criterion** - The affected groundwater will not be transported to groundwater that is a source of drinking water, or that is a reasonably expected potential future source of drinking water.

**Basis** -The contaminated groundwater is not upgradient from a potential drinking water aquifer. The groundwater flows locally toward Red Fox Creek, which flows subparallel to Eskimo Creek into the Naknek River. Groundwater from the landfills and fire training areas has no reasonable transport pathway to the drinking water aquifer in the main base area.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

# PUBLIC MEETING

## Announcement

A Public Meeting will be held at the King Salmon Air Station lounge on Tuesday April 27, 2004, at 7:00 p.m.

**BRING YOUR CONCERNS, COMMENTS, AND QUESTIONS TO OPEN DISCUSSIONS  
WITH USAF AND ADEC REPRESENTATIVES TO THE MEETING FOR THE  
LANDFILLS AND FIRE TRAINING AREAS PROPOSED PLAN**

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

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